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CONGRUENCY OF SCIENTISTS' MOTIVES WITH THEIR ORGANIZATIONS' PROVISIONS FOR SATISFYING THEM: ITS RELATIONSHIP TO MOTIVATION, AFFECTIVE JOB EXPERIENCES, STYLES OF WORK, AND PERFORMANCE

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This paper is submitted to fulfill the first year research requirement for graduate students in the department of psychology of the University of Michigan.

The study was conducted at the Survey Research Center of the Institute for Social Research.

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The relationship of job satisfaction to motivation, affective job experiences, style of work, and performance has been a question of central importance to those concerned with the human side of enterprise. Although human relations programs have often assumed that the satisfied employee is highly motivated to perform in the manner advocated by the organization and therefore to be highly productive, results of studies testing this assumption have been inconclusive. Several of these are summarized in Argyris (5) and Likert (8).

The thesis of Argyris' Personality and Organization (5) suggests a somewhat different approach to this question if certain assumptions are made. Argyris spoke of something very similar to satisfaction: congruency between needs of individuals and demands of formal organizations, and he made specific postulates concerning congruency. Satisfaction may be said to have a potential for occurring when a state of congruency exists between a need or motive of an individual and a demand or provision by his organization relevant to this need. For example, if an individual reported that earning a good salary was of "great" importance to him and that his organization provided a "great" opportunity for earning a good salary, his motive to earn a good salary is congruent with the provision by his organization relevant to this motive, and this motive is potentially capable of being

satisfied by his organization. If a relatively large number of an individual's motives are satisfied by his organization, it may be said that his job satisfaction is high. Thus congruency may be thought of as potential satisfaction and total congruency for all the individual's motives as potential job satisfaction.

Th use of congruency or potential satisfaction to predict motivation, affective job experiences, style of work, or performance has two distinct advantages over predicting from direct measures of current satisfaction:

1. Congruency focuses on both the person and the organisational environment. Assuming that Lewin's (7) statement, "behavior (B) is a function (F) of the person (P) and of his environment (E), B = F(P,E)," holds true, both P and E must be considered in accounting for behavior. While direct measures of satisfaction tap the interaction of P and E, ("How satisfied are you with your job?"), measures of congruency ask about P and E separately ("How much of X do you want in your job; how much of X does your job provide?"). Thus measures of congruency provide information about the person and his environment as distinct from the interaction between them.

2. Congruency focuses on specific motives. Responses to questionnaire items concerning overall feelings of satisfaction are influenced by a multitude of factors which the individual must implicitly consider in reporting his impressions. In answering such questions he must determine what

his needs are, how important each of them is to him, and the extent to which each is being satisfied relative to its importance. Measures of congruency account specifically for many of the underlying factors by making those implicit considerations explicit.

Argyris summarized his primary findings in a "grand hypothesis" of ten propositions, the first two of which are re-stated below:

> Proposition I. There is a lack of congruency between the needs of healthy individuals and the demands of the formal organization.
>
> If one uses the traditional formal principles of organization (i.e., traditional chain of command, task specialization) to create a social organization, and
>
> if one uses as an input, agents who tend toward a mature state of psychological development (i.e., they are predisposed toward relative independence, activeness, use of important abilities),
>
> one creates a disturbance because the needs listed above of healthy individuals are not congruent with the requirements of formal organization, which tends to require the agents to work in situations where they are dependent, passive, and use few and unimportant abilities.
>
> Corollary I. The disturbance will vary in proportion to the degree of incongruency between the needs of the individuals and the requirements of the formal organization...
>
> An administrator, therefore, is always faced with an inherent tendency toward continual disturbance.
>
> Proposition II. The resultants of this disturbance are frustration, failure, short time perspective, and conflict.
>
> If the agents are predisposed to a healthy, more mature self-actualization:
>
> 1. They will tend to experience frustration because their self-actualization will be blocked.
> 2. They will tend to experience failure because they will not be permitted to define their own goals in relation to central needs, and the paths to these goals.
> 3. They will tend to experience short time perspective because they have no control over the clarity and stability of their future... (5, p. 233.)

Proposition III stated in part:

> The resultants of the disturbance in the organiza-

tion will tend to increase in degree...

a. As one goes down the chain of command (5, p. 234.)

Using these propositions as a guide, the present study investigated the relationship between congruency or potential satisfaction and motivation, certain affective job experiences, styles of work, and performance. Measures of these factors were obtained from responses to items on a questionnaire which was administered in a larger investigation of motivations and working relationships of scientific personnel.[1] Thus the study was restricted to a fairly homogeneous sample of the many types of personalities and organizations to which the "grand hypothesis" refers. The following questions were investigated in the study:

(1) To what extent is there an incongruency between the motives of the scientists and the provisions by their organizations for satisfying those motives? (Proposition I.)

(2) Do the individuals with the greatest incongruency tend to experience more disturbance, frustration, failure, and short time perspective? (Proposition II.) Do they tend to avoid taking risks?

(3) Do incongruency and its resultants increase as one goes down the chain of command? (Proposition III.a.)

(4) Is there any relationship between the degree of congruency and scientific performance?

(5) Is total motive congruency the best predictor in questions (2), (3), and (4), or does a different pattern of congruency and its resultants emerge for different motives?

(6) Do different patterns of congruency and its resultants emerge for doctoral and non-doctoral scientists?

(7) Do different patterns of congruency and its

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[1] Study of Scientific Personnel. Institute for Social Research, University of Michigan. Dr. Donald C. Pelz is project director.

resultants emerge for scientists in departments emphasizing research and scientists in departments emphasizing development?

(8) Do different patterns of congruency and its resultants emerge for scientists in departments which are relatively coordinated in selection of work goals and relationships with colleagues and for scientists in departments which are relatively autonomous in these respects?

Subjects

The respondents were 513 scientists from 11 university, industrial, and government laboratories engaged in research or development in the physical, biological, or social sciences. Included were various university departments; manufacturers of chemical, pharmaceutical, and electronic products; and laboratories engaged in agricultural research. The scientists ranged in age from their early twenties to their late sixties. All had received bachelor's degrees, and a great many had earned a master's degree or doctorate.

Method of Analysis

Measures of congruency and the dependent variables were constructed as explained below. Pearson product-moment correlations were computed among the independent and dependent variables after ascertaining that distributions of scores on none of the variables departed markedly from a normal distribution. Intercorrelations were computed separately for each of six groups of scientists which had been found to differ in previous analyses. The groups were determined by dichotomizing on the following three dimensions: (1) whether or not the scientist held a doctorate, (2) whether the sci-

entist's department was engaged chiefly in research or development, and (3) whether the scientist's department was coordinated or autonomous in selection of work goals and relationships with other men at similar organizational levels. (For details on these dimensions, see Andrews and Pelz (4).) Of the eight possible groups, only six contained more than thirty respondents:

A. Ph. D.'s in autonomous research departments, N = 72.
B. Ph. D.'s in autonomous development departments, N = 36.
C. Ph. D.'s in coordinated development departments, N = 59.
D. Non-Ph. D.'s in autonomous research departments, N = 58.
E. Non-Ph. D.'s in autonomous development departments, N = 133.
F. Non-Ph. D.'s in coordinated development departments, N = 135

Independent Measures: Measures of Congruency

Respondents were asked to rate on five-point scales the importance they attached to certain job opportunities and the provision in their present jobs for each of these factors:

> Q. 62. Listed below are different kinds of opportunities which a job might afford. If you were to seek a job, how much importance would you personally attach to each of these (disregarding whether or not your present job provides them)?
>
> ______Slight or none
> ______Moderate
> ______Considerable
> ______Great
> ______Utmost
>
> Q. 63. Now, to what extent does your present job actually provide an opportunity for each of these factors?
>
> ______Slight or none
> ______Moderate
> ______Considerable
> ______Great
> ______Complete

The opportunities or factors selected for this study were the following:

Q. 62 and Q. 63:

- A. to make full use of my present knowledge and skills
- B. to grow and learn new knowledge and skills
- C. to earn a good salary
- D. to advance in administrative authority and status
- F. to have congenial co-workers as colleagues
- H. to associate with top executives in the organization
- J. to work on difficult and challenging problems
- L. to have freedom to carry out my own ideas

The importance attached to the factors (Q. 62) was considered to be a measure of the strength of various motives, and the extent of the opportunities to satisfy these motives (Q. 63) was called a measure of the organization's provision for each motive.

Since frequency distributions of responses to these items showed very few responses in the extreme category on each item, each of the items was adjusted to a four-point scale by combining two categories at one extreme of the original five-point scale. The range for factors A, B, C, F, J, and L became 2-5; the range for D and H, 1-4. Next, intercorrelations among the items were determined separately for research and development departments. (See Appendix A.) For both motive and provision items in both research and development departments, two distinct clusters emerged: items A, B, J, and L and items C, D, and H. Examination of the content of the items indicated that A, B, J, and L measured what might be called "self-actualization," and C, D, and H measured more extrinsic motivation--what might be termed "status." Item F, which did not correlate highly with

any other item, was labeled a measure of a "social" factor. Indices of "motive for self-actualization," "motive for status," "provision for self-actualization," and " provision for status" were then computed simply by summing the scores on the items in each cluster, since the variances of the items within each cluster were very similar.

Two measures of congruency were computed for each of the three factors. "Perceived congruency" was determined by subtracting the individual's motive from his perception of his organization's provision for satisfying that motive. "Objective congruency" was determined by subtracting the individual's motive from the mean of the provisions for that motive perceived by all members of his department in a "similar job situation." Individuals were said to be in similar job situations if they were in the same department and fell into the same one of the following eight groups: (1) university doctorates, (2) government doctorates in research departments, (3) industrial doctorates in development departments, (4) government doctorates in development departments, (5) industrial non-doctorates in laboratories with many doctoral scientists, (6) government non-doctorates in laboratories with many doctoral scientists, (7) industrial non-doctorates in laboratories with few doctoral scientists, and (8) government non-doctorates in laboratories with few doctoral scientists. In this manner the 513 respondents were divided into 85 groups of 4 to 20 members in similar job situations.

In addition, measures of total perceived congruency and total objective congruency were determined by summing the congruency scores on each of the three factors after weighting them according to their variances. Thus a total of eight measures of congruency were available: perceived and objective measures of self-actualization congruency, status congruency, social congruency, and total congruency.

Dependent Measures

Items from the questionnaire which appeared to measure disturbance, frustration, failure, and time perspective were intercorrelated separately for individuals in research and development departments. (See Appendix B.) In addition, a measure was made of the scientists' "motive to avoid taking risks," and five indices of performance were used.

Disturbance. Four items reflecting the intensity of the respondent's motivation were found to be highly intercorrelated:

> Q. 11. One project may seem like a "labor of love," with which you feel strongly identified; it seems like a part of yourself, your own brain-child. Another project may be just an assignment about which you feel detached and impersonal. How do you feel toward...(your most important project)?
>
> My sense of identification is:
>
> _____non-existent; I feel completely detached
> _____slight
> _____moderate
> _____strong
> _____very strong
> _____intense; seems like a part of myself
>
> Q. 52. How important do you personally feel your present technical work is--that is, how much of a contribution is it likely to make, either to technical

knowledge, or to practical application, or by other standards?

_____of no importance either for knowledge or application
_____of slight importance
_____moderate
_____substantial
_____very substantial
_____utmost; one of the most important of its type anywhere in the world today

Q. 53. Some individuals are completely involved in their technical work--absorbed by it night and day. For others, their work is simply one of several interests. How involved do you feel in your work?

_____not much involved
_____slightly involved
_____moderately
_____strongly
_____very strongly
_____completely; the most absorbing thing in my life

Q. 57. How interesting or exciting do you find your present work?

_____hardly interesting at all; pedestrian
_____mildly interesting
_____quite interesting; occasionally exciting
_____exciting much of the time
_____exciting most of the time
_____continually exciting

By assuming that a high score on identification, importance, involvement, and interest is indicative of low disturbance, scores on these four items were summed, after adjusting them to produce approximately equal variances, to make an index of general disturbance.

Frustration. One item was used as a measure of frustration:

Q. 59. How would you describe the ratio between the difficulties of your current work, and the abilities (knowledge, skill, experience) you have to meet these problems?

_____Difficulties far outweigh my abilities; the work constantly baffles me
_____difficulties somewhat outweigh abilities

______abilities barely equal difficulties
______abilities somewhat outweigh difficulties
______abilities clearly outweigh difficulties; smooth sailing ahead

It was assumed that an individual who reported that the difficulties of his work were greater than his abilities to cope with them would also have reported that he was frustrated by his work if he had been asked.

Failure. Respondents were asked:

Q. 10. How do you feel about the rate of progress you are making on (your most important) project, compared with your expectations?

The rate of progress is:
______much slower than I had expected
______somewhat slower than I had expected
______adequate; but what could normally be expected
______good; faster than I had expected
______very good; much faster than I had expected
______amazing; as fast as I could hope for

It was assumed that a slow rate of progress relative to his expectations was indicative of a feeling of failure by the respondent.

Time perspective. Two measures of time perspective, one measuring a short-range perspective and the other measuring a long-range perspective, were (surprisingly) found to be nearly independent of each other. Therefore, both were used.

Short-range perspective:

Q. 19. Scientists and engineers may differ widely in their characteristic approach to their work--both the kinds of problems that attract them, and the way they go about the task. How closely does each statement describe the approach you typically prefer to use.

M. I prefer to find immediate solutions to specific problems

______Not at all 0%
______15%

_____30%
_____Moderately 50%
_____70%
_____85%
_____Completely 100%

Long-range perspective:

Q. 19. R. I prefer to plan a long-range series of related tasks, which I follow more-or-less systematically

(Scale same as above)

Q. 19. S. I prefer to alter my direction from week to week as new developments arise

(Scale as above, but reversed)

Scores on these items were simply summed to form the measures of long range time perspective, since their variances were nearly equal.

Motive to avoid taking risks. A factor analysis by Andrews (2) of 43 of the items in the questionnaire produced the following cluster, all from question 19:

D. I prefer areas where I can be fairly sure of some acceptable results, even though not spectacular

F. I prefer to probe deeply and thoroughly in selected areas, even though narrow

M. I prefer to find immediate solutions to specific problems

O. I prefer to find out all I can by observation, before trying to generalize

I. I'm effective as a "right hand man," carrying ball for a more experienced advisor

The sum of the scores on those items constitutes what Andrews called the motive to avoid risks.

Performance measures. Two different types of performance measures were used: (1) a logarithmic transformation of the number of patents, papers, and unpublished reports

produced by the scientist during the last five years, and (2) qualitative evaluations by supervisors and colleagues of the respondent's contribution to knowledge in his field and usefulness in helping his technical division to carry out its responsibilities. All five performance measures were adjusted to hold constant the effects of education, length of work experience, type of research setting, and time between B. S. and Ph. D. or age at B. S. (For details see Pelz (10, 9) and Andrews (3, 1).)

In order to test Proposition III. a., which says that the resultants of the disturbance will increase in degree as one goes down in the chain of command, an index of each respondent's status in his organization was computed by summing the respondent's income, number of subordinates, and length of time in his technical division while weighting these items to equate variances. (For details, see Andrews (1).)

Results

Question (1). To what extent is there an incongruency between the motives of the scientists and the provisions by their organizations for satisfaction of these motives? As shown in Table 1, more than sixty per cent of the scientists preferred to have more opportunities for satisfying their motives for self-actualization and status than their organizations provided, and over thirty per cent reported an incongruency on the social motive. These findings held true whether perceived or objective measures of congruency were

used. Thus Argyris' Proposition I received substantial support.

Question 2. Do the individuals with the greatest incongruency tend to experience more disturbance, frustration, failure, and short time perspective (Postulate II)? Do they tend to avoid taking risks? Tables 2-7 show correlations between the eight different measures of congruency and the dependent variables of Proposition II for each of the six groups used in the analysis. The overall probability of obtaining correlation coefficients as large as those actually obtained in making six independent tests of the same question was determined by using the additivity property of chi square (discussed in Guilford (6), pp. 244-247). The probabilities shown are two-tailed; that is, they indicate the probability of obtaining either positive or negative correlations of the size of those actually obtained. Although the direction of the relationship could have been predicted in most cases, it was decided to use two-tailed tests so that results in the direction not expected could also be discussed. Results in the unexpected direction are indicated by three asterisks in the "Overall Probability" columns of the tables which follow.

Disturbance. It will be recalled that items reflecting involvement, interest, identification, and importance were combined to form an index of intensity of motivation and that a high score on this index was assumed to be indicative of little "disturbance." If Argyris' Proposition II was correct, positive correlations between congruency and intensity

of motivation would have been expected. Table 2 shows that this was the case when perceived measures of congruency were used; the more the scientist perceived his motives as being potentially satisfied in his organization, the greater his motivation and the less his disturbance. Objective measures of congruency showed no such relationships; in fact, with the self-actualization motive, the more the actual provision exceeded the individual's motive, the less his reported motivation.

Frustration. Proposition II states that individuals will tend to experience frustration because their self-actualization will be blocked. It would be predicted, therefore, that a negative relationship occurred between self-actualization congruency and the measure of frustration (the ratio of the difficulties of the job to the respondent's abilities to cope with them) and that no particular relationship existed between other types of congruency and frustration. Table 3 shows that the findings strongly confirmed this prediction.

Failure. According to Proposition II, respondents would be expected to report less failure or a greater rate of progress when they reported higher congruency. Table 4 shows no strong evidence favoring or opposing this expectation.

Time perspective. Table 5 shows that with certain exceptions a negative relationship occurred between congruency measures and short time perspective, as expected from Proposition II. Objective measures of congruency

showed stronger relationships, and status congruency showed the strongest relationships of all. As can be seen from Table 6, no particular relationship occurred between congruency and long-range time perspective although Proposition II predicts a positive one.

Motive to avoid risks. Table 7 shows a clear negative relationship between all measures of congruency and the motive to avoid risks. The relationship is highly significant in all but one case. Thus, the more a scientist's motives are potentially satisfied by his organization, the more willing he is to take risks in his work.

Question 3. Do incongruency and its resultants increase as one goes down the chain of command? (Proposition III. a.) This proposition received substantial support as Table 8 demonstrates. With one exception, the eight measures of congruency were positively correlated with the index of status in the organization (p of .05 or less). With increasing status, motivation tended to increase, feelings of failure tended to decrease, and risks were more apt to be taken. No clear relationships were found between status and frustration or time perspective.

Question 4. Is there any relationship between the degree of congruency and scientific performance? Tables 9 and 10 show that there was a definite tendency for scientists who reported high congruency to be rated high in scientific contribution and usefulness to their organizations. With all measures of perceived congruency, and objective measures of total congruency and social congruency, the relationships

were significant at better than the .05 level. No general relationships occurred between congruency and output of patents, papers, or unpublished reports, as Tables 11, 12, and 13 demonstrate. An overall pattern would not be expected,[2] since different types of laboratories stressed different types of output; however, positive correlations might be expected to occur for patents in development departments and for papers in research departments. Table 11 shows that for the groups of scientists in development departments, 20 of 31 correlation coefficients between designated measures of congruency and patents were positive, 5 being significant at the .05 level. As Table 12 indicates, 11 of 16 correlations between congruency and papers were positive for scientists in research, none of them being statistically significant. No trends seemed likely for the various groups of scientists in the relationships between measures of congruency and unpublished reports; Table 13 shows that none were found, although positive correlations generally occurred.

Question 5. Is total motive congruency the best predictor in questions (2), (3), and (4), or does a different pattern of congruency and its resultants emerge for different motives? In order to answer this question with reference to question 2, it was necessary to summarize the correlations between each measure of congruency and the six

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[2] Tables 11, 12, and 13 are summarized as if positive relationships were expected.

dependent measures of Proposition II for all six groups of scientists. A summary of the number of positive, negative, and significant correlations was made and points were assigned as indicated in Table 14. Despite the arbitrary assumptions made, certain pronounced tendencies were discovered. Except in the case of the social motive, the perceived measures of congruency showed stronger relationships in the expected direction than the objective measures. Status congruency and self-actualization congruency generally showed stronger relationships than social congruency.

All measures of congruency, except objective self-actualization congruency, showed strong positive relationships to the scientist's position in the chain of command (question 3, Table 8). All the perceived measures showed strong relationships in the expected direction to judgments of contribution and usefulness, while of the objective measures only total congruency and social congruency showed significant relationships (question 4, Tables 9 and 10). No overall summary was made for the three measures of output, since the directions of the relationships were considered unpredictable in those cases. Thus, although the perceived and objective measures of total congruency were very good predictors of (2), (3), and (4), a different pattern of congruency and its resultants did in fact emerge for different motives.

Question 6. Do different patterns of congruency and its resultants emerge for doctoral and non-doctoral scientists? Tables 15 and 16 summarize separately for doctoral and non-

doctoral scientists the correlations between congruency and the measures of Proposition II and judgments of performance. The rough point system (described in Table 14) showed a slight tendency for stronger relationships to occur for the non-doctoral scientists when Proposition II was tested and a pronounced tendency for stronger relationships in the non-doctoral groups when judgments of performance were used. The greatest difference occurred in the relationships between self-actualization congruency and judgments of performance, which tended to be stronger for non-doctoral scientists.

Question 7. Do different patterns of congruency and its resultants emerge for scientists in departments emphasizing research and scientists in departments emphasizing development? Tables 17 and 18 summarize the correlations separately for scientists in research and development departments. Since only two of the six groups of scientists were in research departments while four groups were in development departments, the figures in Tables 17 and 18 for the research departments may be doubled for purposes of comparison. In general, stronger relationships were found in the development departments. The greatest differences occurred for Proposition II when the total congruency and self-actualization congruency measures were used. Status and social congruency showed the greatest differences for the judgments of performance.

Question 8. Do different patterns of congruency and

its resultants emerge for scientists in departments which are relatively coordinated in selection of work goals and relationships with colleagues and for scientists in departments which are relatively autonomous in these respects? Tables 19 and 20 summarize the correlations separately for scientists in autonomous and coordinated departments. Since only two of the six groups of scientists were in coordinated departments while four groups were in autonomous departments, the figures for the coordinated departments may be doubled for purposes of comparison. The rough point system indicated that stronger relationships were found in coordinated departments using the measures of Proposition II, the overall difference being due almost entirely to differences when the self-actualization measures of congruency were used. Strong positive relationships between self-actualization congruency and the measures of Proposition II occurred for scientists in coordinated departments, but strong relationships in both the expected and unexpected directions occurred for the scientists in autonomous departments. Little difference was found between autonomous and coordinated departments when relationships between measures of congruency and judgments of performance were examined.

Discussion

The above results generally supported the propositions of Argyris which were tested, although the indices of disturbance, frustration, failure, and time perspective may not have measured precisely the factors to which Argyris referred.

His propositions concerning the widespread existence of incongruency, "disturbance" or intensity of motivation, and the individual's status in the chain of command received strong confirmation, and certain types of congruency were found to be related to the specific affective job experiences and styles of work in the manner he predicted. Thus, Argyris' "grand hypothesis" as it now stands was shown to be a useful, if imperfect framework for studying the behavior of scientists in organizations.

Whether the "grand hypothesis" applies to people and organizations in general is difficult to say on the basis of the present study, however, since limiting the subjects to scientific personnel may have had either of two effects:

(1) it may have dealt with a subgroup of people in organizations for which the grand hypothesis generally does hold true, thus producing stronger relationships than occur when all kinds of people and organizations are considered, or

(2) it may have dealt with a restricted range of congruency as it exists in the general population of people and organizations, perhaps by dealing with a select group of people who generally experience high congruency, thus producing lower correlations than a study of a wider range of occupational groups would have found.

Further evidence from the present study indicates that the "grand hypothesis" must be elaborated. Although the total congruency measures were good predictors, different patterns of congruency and its resultants emerged in many instances for different motives; this finding suggests that

Argyris' propositions should be extended to account specifically for the varying effects of different motives. Moreover, when the relationships between congruency and the measures of Proposition II were summarized, more were found in the predicted direction for non-doctoral scientists than doctoral scientists, development than research departments, and coordinated than autonomous departments. The relationships between congruency and judgments of performance were stronger for non-doctoral scientists and in development departments. It seems highly improbable that any comprehensive theory of organizational behavior, such as the one with which Argyris makes a first attempt, can be very effective without accounting specifically for such inter-organizational differences.

Although there appears to be no clear explanation for stronger relationships being found for non-doctoral scientists, development departments, and coordinated departments, a tentative one may be advanced. Intuitively, it seems that scientists in these situations are apt to be more dependent upon their organizations for satisfaction of their needs than scientists in the opposite situations; that is, the provision for the satisfaction of their needs must come more from their organizations than from any other source such as themselves or professional colleagues in other organizations. The doctoral scientist doing research in a university, for example, is probably more dependent upon his own initiative for self-actualization provisions and the opinions of professional colleagues outside his organization for status than is the

non-doctoral scientist developing a particular product for his organization.

In general, perceived measures of congruency showed somewhat stronger relationships than objective measures to the several dependent variables. This hold true whether the dependent measure was based on the respondent's reported feelings, as in the measures of affective job experiences and motivation, or on information not directly influenced by the respondent's feelings, such as the measures of style of work and the judgments of performance. Thus, the scientist's perception of his organization's potential for satisfying his needs may well be a more important determinant of his behavior than the facilities his organization actually provides.

The pronounced tendency for the measures of congruency to be positively correlated with judgments of job performance is of particular interest, since in other studies clear relationships between satisfaction and performance generally have not been found. Two explanations could account for the positive relationships being found in the present study. Likert (8, p. 16) reports, "For professional work there is a positive relationship between job satisfaction and performance." Since all the respondents in the present study were scientists, the finding may be nothing more than confirmation of Likert's conclusion. An equally plausible reason is that the measures used in the present study did not deal with satisfaction *per se*, but instead with congruency or potential satisfaction. Perhaps a scientist will perform well if he believes his motives are capable of being satisfied by his organization, regardless

of whether or not they actually are being satisfied; potential satisfaction or congruency may well be a better predictor of performance than satisfaction itself. A choice between these explanations awaits a further study in which the present framework is applied to non-professional workers.

The findings of this study could have important implications for the placement of scientific personnel and the design of their working environments. By focusing on the individual's needs and his impressions of his organization's provisions for satisfying them, measures of congruency deal with factors which can be measured directly and manipulated so that an optimal match of personality and organization can be obtained. For example, since high performance was found to be associated with high congruency, scientists could be placed in jobs which they perceive as providing opportunities for satisfaction of their stated motives. The scientist who reports a strong motive for status could be placed in a job which he sees as giving him an opportunity to achieve status, and a scientist who reports a strong motive to have congenial co-workers could be placed with colleagues whom he perceives as congenial.

Summary

The present study investigated relationships between congruency--which was operationally defined as the difference between the strength of an individual's motive and his organization's provision for satisfying it--and motivation, certain affective job experiences, styles of work, and performance,

using propositions selected from Argyris' (5) "grand hypothesis" as a framework. A questionnaire concerning motivations and working relationships was administered to 513 scientists from 11 university, industrial, and government laboratories, and their responses were used to measure perceived and objective congruency for three motives and the dependent variables. Intercorrelations were computed among the measures of congruency and the dependent variables, and the following results were obtained:

(1) More than 60 per cent of the scientists reported that their motives for self-actualization and status were greater than their organizations' provisions for satisfying them, and more than 30 per cent reported incongruency for their social motive. (Proposition I)

(2) A pronounced tendency was found for scientists having high congruency to report a greater intensity of motivation (less "disturbance"). The scientists tended to report experiences of "frustration" when their self-actualization was low. No general relationship was found between measures of congruency and "failure." Scientists with high congruency tended to be willing to take risks and not to have a short time perspective. (Proposition II)

(3) With increasing status in their organizations, the scientists tended to report higher congruency, more intense motivation, more willingness to take risks, and decreased feelings of failure. No clear relationships were found between status and frustration or time perspective. (Proposition III. a.)

(4) Scientists having high congruency were rated high by their superiors and colleagues in scientific contribution and usefulness to their organizations. In some instances positive correlations were obtained between congruency and output of patents and published papers.

(5) Although the perceived and objective measures of total congruency were very good predictors of (2), (3), and (4), a different pattern of congruency and its resultants occurred for different motives. Perceived measures of congruency were somewhat more effective than objective measures.

(6), (7), (8) The relationships between congruency and motivation, affective job experiences, and styles of work were more pronounced for non-doctoral than doctoral scientists, scientists in development departments than scientists in research departments, and scientists in coordinated departments than scientists in autonomous departments. The relationships between congruency and judgments of performance were more pronounced for non-doctoral scientists and scientists in development departments than for their counterparts.

It was concluded that Argyris' "grand hypothesis" is a useful framework for studying the behavior of people in organizations, but it is incomplete in not specifying the effects of congruency for specific motives and the differences according to certain dimensions of organizational atmosphere. Two plausible explanations for the strong positive relationships found between congruency or potential satisfaction and performance were proposed, and a possible practical implication for assigning people to jobs was mentioned.

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Tables and Appendices

CONGRUENCY OF SCIENTISTS' MOTIVES WITH THEIR ORGANIZATIONS' PROVISIONS FOR SATISFYING THEM: ITS RELATIONSHIP TO MOTIVATION, AFFECTIVE JOB EXPERIENCES, STYLES OF WORK, AND PERFORMANCE

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November 17, 1962

TABLE 1

EXTENT OF CONGRUENCY FOR VARIOUS MOTIVES

	Percent of Respondents		
	Need exceeds provision	Need equals provision	Need is less than provision
Self-Actualization			
Perceived	21%	14%	65%
Objective	27	12	61
Status			
Perceived	21%	18%	61%
Objective	23	15	62
Social			
Perceived	26%	42%	32%
Objective	27	38	35

TABLE 2

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND INTENSITY OF MOTIVATION FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group A	B	C	D	E	F	Overall Probability
Total							
Perceived	.08	-.06	.25	.08	.27**	.42**	< .01
Objective	-.13	-.18	-.03	-.07	-.06	.17	≈1.00
Self-actualization							
Perceived	.09	.07	.29*	.19	.32**	.32**	< .01
Objective	-.29	-.14	-.09	-.30*	-.27**	-.05	< .01***
Status							
Perceived	-.00	-.37*	.21	.17	.21*	.19*	.01
Objective	-.06	-.37*	-.02	-.07	-.12	.02	.14***
Social							
Perceived	-.00	.07	.18	.04	.13	.37**	< .01
Objective	-.01	.06	.03	.10	.10	.20*	.10

*$p < .05$ for a correlation this size for this group

**$p < .01$ for a correlation this size for this group

***Direction of relationship is opposite to that expected

TABLE 3

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND "FRUSTRATION" FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency			Group				Overall Probability
	A	B	C	D	E	F	
Total							
Perceived	-.03	-.03	.18	.02	-.11	-.09	.98
Objective	-.20	-.02	.11	.11	-.01	.00	~1.00
Self-actualization							
Perceived	-.11	-.08	-.11	-.16	-.38**	-.29**	< .01
Objective	-.20	.00	-.02	-.21	-.17*	-.12	< .01
Status							
Perceived	.08	.02	.00	-.08	-.11	-.07	.66
Objective	-.04	.12	-.03	-.02	.00	-.02	~1.00
Social							
Perceived	-.06	-.07	.27*	.19	.02	-.01	.26***
Objective	-.08	-.08	.17	.31*	.06	.06	.10***

*$p < .05$ for a correlation this size for this group

**$p < .01$ for a correlation this size for this group

***Direction of relationship is opposite to that expected

TABLE 4

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND RATE OF PROGRESS FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of			Group				Overall
Congruency	A	B	C	D	E	F	Probability
Total							
Perceived	-.04	.07	.37*	-.08	-.02	-.01	.60
Objective	-.16	.11	.05	-.10	-.06	.08	~1.00
Self-actualization							
Perceived	.08	.04	.25	-.08	.06	.08	.21
Objective	-.17	.17	.08	-.18	-.14	.00	.30***
Status							
Perceived	-.14	.13	.28*	-.00	-.02	.08	.20
Objective	-.03	.08	.10	-.11	-.18*	.03	.51***
Social							
Perceived	-.05	-.10	.19	-.01	-.04	.00	~1.00
Objective	-.11	.04	.03	.10	.02	.12	.66

*$p < .05$ for a correlation this size for this group
**$p < .01$ for a correlation this size for this group
***Direction of relationship is opposite to that expected

TABLE 5

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND SHORT-RANGE TIME PERSPECTIVE FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group						Overall Probability
	A	B	C	D	E	F	
Total							
Perceived	-.31*	-.11	-.00	.26	-.12	.13	.20
Objective	-.37**	-.08	-.14	-.03	-.10	.03	.03
Self-actualization							
Perceived	-.03	-.12	.14	.21	.05	.07	.34***
Objective	-.08	-.17	.02	.15	.03	.04	~1.00***
Status							
Perceived	-.26*	-.22	-.01	-.16	-.12	.13	.01
Objective	-.26*	-.19	-.10	-.34**	-.13	.02	.01
Social							
Perceived	-.26*	-.03	-.02	.26*	-.08	.07	.60
Objective	-.35**	.02	-.04	-.07	-.11	.03	.01

*$p < .05$ for a correlation this size for this group

**$p < .01$ for a correlation this size for this group

***Direction of relationship is opposite to that expected

TABLE 6

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND LONG-RANGE TIME PERSPECTIVE FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group A	B	C	D	E	F	Overall Probability
Total							
Perceived	.08	-.21	-.08	.03	.03	.21*	.30
Objective	.23*	-.03	-.19	-.02	-.03	.06	.95
Self-actualization							
Perceived	-.28*	-.38*	.14	-.05	-.03	.15	.06***
Objective	-.05	-.07	.09	.05	-.00	.09	.94
Status							
Perceived	.10	-.14	-.05	-.07	.10	.15	.44
Objective	.15	-.22	-.10	-.15	-.03	-.06	.40***
Social							
Perceived	.20	-.11	-.15	-.10	-.02	.17	.48
Objective	.29*	.08	-.28*	-.05	-.02	.07	.34

*$p < .05$ for a correlation of this size for this group

*** Direction of relationship is opposite to that expected

TABLE 7

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND "MOTIVE TO AVOID RISKS" FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group A	B	C	D	E	F	Overall Probability
Total							
Perceived	-.33**	-.24	-.10	.26	-.17*	-.11	< .01
Objective	-.25*	-.08	-.24	-.04	-.26**	-.15	< .01
Self-actualization							
Perceived	-.22	-.20	-.01	.31*	-.02	-.14	.15
Objective	-.10	-.18	-.21	.02	-.16	-.16	.02
Status							
Perceived	-.26*	-.39*	.05	-.07	-.20*	.06	< .01
Objective	-.24	.02	-.05	-.39**	-.18*	-.04	< .01
Social							
Perceived	-.28*	-.12	-.11	.13	-.16	-.16	.02
Objective	-.21	.02	-.23	-.00	-.23**	-.08	< .01

*$p < .05$ for a correlation this size for this group

**$p < .01$ for a correlation this size for this group

TABLE 8

CORRELATIONS BETWEEN STATUS AND DESIGNATED MEASURES OF CONGRUENCY, INTENSITY OF MOTIVATION, AND RESULTANTS OF DISTURBANCE FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

	Group						Overall
	A	B	C	D	E	F	Probability
Total Congruency							
Perceived	.17	.53**	.22	.13	.23**	.41**	$<.01$
Objective	-.04	.33	.09	.10	.11	.23**	$<.01$
Self-actualization Congruency							
Perceived	.13	.11	.23	.31*	.34**	.28**	$<.01$
Objective	-.07	-.14	.15	.29	.17*	.17	$<.01$
Status congruency							
Perceived	.24	.62**	.37**	-.05	.20*	.40**	$<.01$
Objective	-.04	.10	.14	-.25	-.05	.16	.53
Social congruency							
Perceived	.07	.41*	.08	-.14	.14	.28**	$<.01$
Objective	.00	.35	.04	.06	.10	.16	$<.05$
Intensity of motivation	.19	-.18	.26*	.00	.30**	.36**	$<.01$
Frustration	.01	-.08	.01	-.10	-.04	-.07	.72
Rate of progress	.12	-.01	.27*	.06	.20*	.06	$<.01$
Time perspective							
Short-range	.02	-.01	-.16	.11	-.11	.04	.76
Long-range	-.04	.03	.10	.13	.04	.14	.28
Motive to avoid risks	-.00	-.15	-.17	.18	-.15	-.15	.06

*p $<$ .05 for a correlation of this size for this group

**p $<$ .01 for a correlation of this size for this group

TABLE 9

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND JUDGMENTS OF TECHNICAL CONTRIBUTION FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group						Overall Probability
	A	B	C	D	E	F	
Total							
Perceived	.28*	.40**	-.15	.09	.21**	.23**	< .01
Objective	.10	.25	-.17	.19	.19*	.06	.03
Self-actualization							
Perceived	.21	.07	-.03	.16	.20*	.22**	< .01
Objective	-.26*	.09	.13	.00	.02	.12	.56
Status							
Perceived	.01	.23	.02	.35**	.28**	.20*	< .01
Objective	-.11	-.22	-.24	.26	.18*	.03	.16
Social							
Perceived	.27*	.42*	-.12	-.24	.06	.11	.02
Objective	.20	.34	-.02	.10	.21*	.02	.02

*$p < .05$ for a correlation of this size for this group

**$p < .01$ for a correlation of this size for this group

TABLE 10

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND JUDGMENTS OF USEFULNESS TO ORGANIZATION FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group						Overall Probability
	A	B	C	D	E	F	
Total							
Perceived	.33*	.53**	.09	.08	.25**	.44**	<.01
Objective	.18	.21	-.15	.17	.12	.15	.03
Self-actualization							
Perceived	.26*	.31	.01	.07	.20*	.34**	<.01
Objective	-.07	.09	-.23	-.11	.06	.13	.45***
Status							
Perceived	.12	.49**	.14	.17	.17*	.41**	<.01
Objective	-.14	-.10	-.19	-.03	.02	.18*	.61***
Social							
Perceived	.25	.37*	.05	-.12	.15	.24**	<.01
Objective	.26*	.13	-.02	.19	.16	.06	.02

*$p < .05$ for a correlation of this size for this group

**$p < .01$ for a correlation of this size for this group

***Direction of relationship is opposite to that expected

TABLE 11

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND OUTPUT OF PATENTS FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group A	B	C	D	E	F	Overall Probability
Total							
Perceived	.06	.22	-.04	.02	.04		.76
Objective	.03	.46*	-.06	-.11	.08	.12	.08
Self-actualization							
Perceived	.24	.19	-.04	-.11	-.04	.12	.26
Objective	.07	.61**	-.08	-.04	-.02	.04	<.01
Status							
Perceived	-.14	.18	.04	.01	-.06	.24**	.15
Objective	.07	-.01	-.14	.23	-.06	.11	.48
Social							
Perceived	.05	.17	-.06	-.09	.12	.19*	.18
Objective	.01	.26	.06	-.24	.17*	.09	.07

*$p < .05$ for a correlation of this size for this group

**$p < .01$ for a correlation of this size for this group

TABLE 12

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND OUTPUT OF PAPERS FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group A	B	C	D	E	F	Overall Probability
Total							
Perceived	.19	-.07	-.12	.16	-.07	-.16	~1.00
Objective	.07	.12	-.12	.04	-.04	-.12	~1.00
Self-actualization							
Perceived	-.15	-.04	-.16	.11	.11	.01	.84***
Objective	-.10	.02	-.07	.25	.06	.04	.49
Status							
Perceived	.11	-.24	.05	.15	.02	-.04	.49
Objective	-.04	-.27	-.09	.05	-.08	-.07	.30***
Social							
Perceived	.08	.04	-.13	-.09	-.10	-.23**	.06
Objective	.13	.22	-.01	-.01	-.06	-.14	~1.00

**p < .01 for a correlation of this size for this group

***Direction of relationship is negative

TABLE 13

CORRELATIONS BETWEEN DESIGNATED MEASURES OF CONGRUENCY AND OUTPUT OF UNPUBLISHED REPORTS FOR SIX GROUPS OF SCIENTISTS (SEE TEXT)

Measure of Congruency	Group A	B	C	D	E	F	Overall Probability
Total							
Perceived	.25	.22	.01	.09	.06	.04	.10
Objective	.08	.25	.01	.12	.08	.01	.96
Self-actualization							
Perceived	.20	-.06	.06	-.02	.12	.09	.18
Objective	-.11	-.25	-.03	.05	.13	.08	.74
Status							
Perceived	.17	.16	.10	.04	.02	.08	.23
Objective	.09	-.09	.02	.13	-.01	-.02	~1.00
Social							
Perceived	.13	.25	-.02	-.00	-.01	.00	.56
Objective	.15	.47*	.05	.13	.05	.02	.04

*$p < .05$ for a correlation of this size for this group

TABLE 14

SUMMARY OF DESIGNATED MEASURES OF CONGRUENCY AS CORRELATEDWITH FACTORS TESTED FROM PROPOSITION II*

Among 36 correlations, for each measure of congruency, number that were:

Measure of Congruency	In Expected Direction .10 or more**	In Expected Direction Signif.	In Unexpected Direction .10 or more**	In Unexpected Direction Signif.	Points***
Total					
Perceived	14	7	5	0	16
Objective	11	3	7	0	7
Self-actualization					
Perceived	16	5	5	3	13
Objective	11	1	8	3	1
Status					
Perceived	17	7	4	1	19
Objective	10	4	8	2	4
Social					
Perceived	12	3	8	2	5
Objective	11	4	4	2	9

*Summary of Tables II--VII

**Including significant r's shown in following column

***Points derived as follows:
+1 for each r of .10 or more in expected direction
+1 additional for each significant r in expected direction
-1 for each r of more than .10 in unexpected direction
-1 additional for each significant r in unexpected direction

TABLE 15

SUMMARY OF DESIGNATED MEASURES OF CONGRUENCY AS CORRELATED WITH FACTORS TESTED FROM PROPOSITION II: DOCTORAL VS. NON-DOCTORAL SCIENTISTS

DOCTORAL

Among 18 correlations for each measure of congruency, number that we

	In Expected Direction		In Unexpected Direction		
Measure of Congruency	.10 or more*	Signif.	.10 or more*	Signif.	Points**
Total					
Perceived	7	3	2	0	8
Objective	7	2	5	0	4
Self-actualization					
Perceived	8	1	3	2	4
Objective	6	0	3	1	2
Status					
Perceived	8	4	3	1	8
Objective	6	1	4	1	2
Social					
Perceived	7	2	4	1	4
Objective	4	2	3	1	2
	53	15	27	7	34

NON-DOCTORAL

Among 18 correlations for each measure of congruency, number that w

	In Expected Direction		In Unexpected Direction		
Measure of Congruency	.10 or more*	Signif.	.10 or more*	Signif.	Points**
Total					
Perceived	7	4	3	0	8
Objective	4	1	2	0	3
Self-actualization					
Perceived	8	4	2	1	9
Objective	5	1	5	2	-1
Status					
Perceived	9	3	1	0	11
Objective	4	3	4	1	2
Social					
Perceived	5	1	4	1	1
Objective	7	2	1	1	7
	49	19	22	6	40

*including significant r's shown in following column

**points derived in same manner as in Table 14

TABLE 16

SUMMARY OF DESIGNATED MEASURES OF CONGRUENCY AS CORRELATED WITH JUDGMENTS OF CONTRIBUTION AND USEFULNESS: DOCTORAL VS. NON-DOCTORAL SCIENTISTS

DOCTORAL

Among 6 correlations for each measure of congruency, number that wo

	In Expected Direction		In Unexpected Direction		
Measure of Congruency	.10 or more*	Signif.	.10 or more*	Signif.	Points**
Total					
Perceived	5	3	1	0	7
Objective	3	0	1	0	2
Self-actualization					
Perceived	4	0	0	0	4
Objective	2	0	2	1	-1
Status					
Perceived	4	2	0	0	6
Objective	2	0	3	0	-1
Social					
Perceived	3	3	1	0	5
Objective	3	0	0	0	3
	26	8	8	1	25

NON-DOCTORAL

Among 6 correlations for each measure of congruency, number that wo

	In Expected Direction		In Unexpected Direction		
Measure of Congruency	.10 or more*	Signif.	.10 or more*	Signif.	Points**
Total					
Perceived	5	4	0	0	9
Objective	5	2	0	0	7
Self-actualization					
Perceived	6	5	0	0	11
Objective	4	1	0	0	5
Status					
Perceived	5	5	0	0	10
Objective	3	1	1	0	3
Social					
Perceived	3	1	2	0	2
Objective	4	1	0	0	5
	35	20	3	0	52

*Including significant r's shown in following column

**Points derived in same manner as in Table 14

TABLE 17

SUMMARY OF DESIGNATED MEASURES OF CONGRUENCY AS CORRELATED WITH FACTORS TESTED FROM PROPOSITION II: RESEARCH VS. DEVELOPMENT DEPARTMENTS*

RESEARCH

Among 12 correlations for each measure of congruency, number that wo

Measure of Congruency	In Expected Direction .10 or more**	In Expected Direction Signif.	In Unexpected Direction .10 or more**	In Unexpected Direction Signif.	Points***
Total					
Perceived	2	2	2	0	2
Objective	4	2	4	0	2
Self-actualization					
Perceived	4	0	3	2	-1
Objective	3	0	5	2	-4
Status					
Perceived	5	2	1	0	6
Objective	5	3	2	0	6
Social					
Perceived	3	2	4	1	0
Objective	5	2	2	1	4
	31	13	23	6	15

DEVELOPMENT

Among 24 correlations for each measure of congruency, number that w

Measure of Congruency	In Expected Direction .10 or more**	In Expected Direction Signif.	In Unexpected Direction .10 or more**	In Unexpected Direction Signif.	Points***
Total					
Perceived	12	5	3	0	14
Objective	7	1	3	0	5
Self-actualization					
Perceived	12	5	2	1	14
Objective	8	1	3	1	5
Status					
Perceived	12	5	3	1	13
Objective	5	1	6	2	-2
Social					
Perceived	9	1	4	1	5
Objective	6	2	2	1	5
	71	21	26	7	59

---

*A rough comparison may be made between research and development departments by doubli the figures for the research departments, since half as many correlations were obtained these departments.

**Including significant r's shown in the following column.

***Points derived in the same manner as in Table 14.

TABLE 18

SUMMARY OF DESIGNATED MEASURES OF CONGRUENCY AS CORRELATED WITH JUDGMENTS OF CONTRIBUTION AND USEFULNESS: RESEARCH AND DEVELOPMENT DEPARTMENTS*

RESEARCH

Among 4 correlations for each measure of congruency, number that wer

Measure of Congruency	In Expected Direction .10 or more**	Signif.	In Unexpected Direction .10 or more**	Signif.	Points***
Total					
Perceived	3	1	0	0	4
Objective	3	0	0	0	3
Self-actualization					
Perceived	4	1	0	0	5
Objective	1	0	1	1	-1
Status					
Perceived	2	1	0	0	3
Objective	1	0	2	0	-1
Social					
Perceived	1	1	2	0	0
Objective	2	0	0	0	2
	17	4	5	1	15

DEVELOPMENT

Among 8 correlations for each measure of congruency, number that we

Measure of Congruency	In Expected Direction .10 or more**	Signif.	In Unexpected Direction .10 or more**	Signif.	Points***
Total					
Perceived	7	6	1	0	12
Objective	5	2	1	0	6
Self-actualization					
Perceived	6	4	0	0	10
Objective	5	1	1	0	5
Status					
Perceived	7	6	0	0	13
Objective	4	1	2	0	3
Social					
Perceived	5	3	1	0	7
Objective	5	1	0	0	6
	44	24	6	0	62

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*A rough comparison may be made between research and development departments by doub the figures for the research departments, since half as many correlations were obtained these department

**Including significant r's shown in following column

***Points derived in same manner as in Table 14

TABLE 19

SUMMARY OF DESIGNATED MEASURES OF CONGRUENCY AS CORRELATED WITH FACTORS TESTED FROM PROPOSITION II: AUTONOMOUS VS. COORDINATED DEPARTMENTS*

AUTONOMOUS

Among 24 correlations for each measure of congruency, number that were:

Measure of Congruency	In Expected Direction .10 or more**	Signif.	In Unexpected Direction .10 or more**	Signif.	Points***
Total					
Perceived	8	4	3	0	9
Objective	7	3	5	0	5
Self-actualization					
Perceived	8	2	4	3	3
Objective	8	1	8	3	-2
Status					
Perceived	13	5	3	1	14
Objective	8	4	7	2	3
Social					
Perceived	6	2	6	1	1
Objective	8	3	2	1	8
	66	24	38	11	41

COORDINATED

Among 12 correlations for each measure of congruency, number that were

Measure of Congruency	In Expected Direction .10 or more**	Signif.	In Unexpected Direction .10 or more**	Signif.	Points***
Total					
Perceived	6	3	2	0	7
Objective	4	0	2	0	2
Self-actualization					
Perceived	8	3	1	0	10
Objective	3	0	0	0	3
Status					
Perceived	4	2	1	0	5
Objective	2	0	1	0	1
Social					
Perceived	6	1	2	1	4
Objective	3	1	2	1	1
	36	10	11	2	33

*A rough comparison may be made between autonomous and coordinated departments by doubling the figures for the coordinated departments, since half as many correlations were obtained for these departments.

**Including significant r's shown in following column

***Points derived in same manner as in Table 14

TABLE 20

SUMMARY OF DESIGNATED MEASURES OF CONGRUENCY AS CORRELATED WITH JUDGMENTS OF CONTRIBUTION AND USEFULNESS: AUTONOMOUS VS. COORDINATED DEPARTMENTS*

AUTONOMOUS

Among 8 correlations for each measure of congruency, number that were:

	In Expected Direction		In Unexpected Direction		
Measure of Congruency	.10 or more**	Signif.	.10 or more**	Signif.	Points***
Total					
Perceived	7	5	0	0	12
Objective	7	1	0	0	8
Self-actualization					
Perceived	7	3	0	0	10
Objective	2	1	2	1	0
Status					
Perceived	6	4	0	0	10
Objective	3	1	3	0	1
Social					
Perceived	4	3	2	0	5
Objective	6	1	0	0	7
	42	19	7	1	53

COORDINATED

Among 4 correlations for each measure of congruency, number that were:

	In Expected Direction		In Unexpected Direction		
Measure of Congruency	.10 or more**	Signif.	.10 or more**	Signif.	Points***
Total					
Perceived	3	2	1	0	4
Objective	1	1	1	0	1
Self-actualization					
Perceived	3	2	0	0	5
Objective	4	0	0	0	4
Status					
Perceived	3	3	0	0	6
Objective	2	0	1	0	1
Social					
Perceived	2	1	1	0	2
Objective	1	0	0	0	1
	19	9	4	0	24

*A rough comparison may be made between autonomous and coordinated departments by doubling the figures for the coordinated departments, since half as many correlations were obtained for these departments.

**Including significant r's shown in following column

***Points derived in same manner as in Table 14

APPENDIX A

Intercorrelations Among Items Used in the Measures of Congruency

(Upper figure in each pair is r for 130 scientists in research departments; lower figure for 383 scientists in development departments; decimal points omitted.)

	Need								Provision						
Question 62: Need	A	B	J	L	C	D	H	F	A	B	J	L	C	D	H
A. Use skills															
B. Learn skills	35 33														
J. Challenge	35 22	40 40													
L. Freedom	35 22	30 31	47 42												
C. Salary	11 09	-01 21	-10 -01	02 08											
D. Status	00 04	00 17	-13 13	03 11	30 46										
H. Associate	08 12	13 12	02 16	00 14	28 30	49 56									
F. Co-workers	15 14	07 22	02 18	-08 08	-07 21	-03 03	13 05								
Question 63: Provision															
A. Use skills	10 16	03 05	20 08	30 13	24 12	07 -02	06 01	-10 10							
B. Learn skills	11 15	27 16	15 14	22 13	07 14	00 13	10 11	-01 08	52 62						
J. Challenge	09 08	16 08	35 29	35 22	03 10	-03 08	-03 05	-03 08	64 51	50 52					
L. Freedom	04 14	14 09	26 21	36 24	06 08	-01 04	10 03	-04 06	61 35	39 44	65 44				
C. Salary	14 11	05 06	00 09	04 -05	02 09	02 -00	14 00	04 12	22 38	18 40	13 40	12 28			
D. Status	-06 03	05 05	12 13	17 08	06 13	09 30	18 18	07 -03	23 26	17 37	20 37	27 26	20 48		
H. Associate	07 04	06 -01	06 08	-01 01	05 12	04 21	24 28	17 -01	27 18	25 26	23 29	24 27	29 24	34 51	
F. Co-workers	05 21	04 14	22 22	09 08	07 13	-10 07	-03 04	23 33	21 28	18 29	24 35	18 29	20 31	20 25	20 21

APPENDIX B

Intercorrelations among Items Used in Measures of Some Dependent Variables

(Upper figure in each pair is r for 130 scientists in research departments; lower figure for 383 scientists in development departments; decimal points omitted.)

	53	57	52	11	59	10	19M
Q. 53--Involvement							
Q. 57--Interest	65 58						
Q. 52--Importance	35 44	47 44					
Q. 11--Identification	46 42	44 48	34 28				
Q. 59--"Frustration"	18 -02	20 -13	18 02	01 00			
Q. 10--Progress	16 05	24 18	24 15	27 16	20 13		
Q. 19M--Immediate Solutions	-13 01	-09 05	01 03	-10 -04	03 -07	-03 02	
Long Range Index	08 14	06 09	14 13	06 05	06 02	-09 14	-03 02

[illegible]EMENT

Date Due

~~NOV 17 '75~~
DEC 05 '75
~~JUL 28 '76~~
~~[illegible]~~
MAR 15 '77
OCT 14 '77
~~MAR 21 '78~~
APR 3 '78
DEC 22 '78
~~FEB 6 '79~~
~~FEB 15 '79~~

APR 28 '79
JAN 4 '80
JAN 16 '80
JUN 19 '80
JAN [illegible]
APR 07 '81
JUL 02 '81
[illegible] 26 [illegible]
OCT 11 '83
[illegible] 1986
APR [illegible]
DEC 18 1986
AP 1[illegible]

MAR 07 1992
APR. [illegible] 1994
NOV. 1 3 [illegible]

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